BEFORE THE BOARD OF ENVIRONMENTAL REVIEW
OF THE STATE OF MONTANA

In the matter of the amendment of ARM 17.30.716, 17.36.912, 17.36.914, 17.36.916, 17.36.922, 17.38.101 and 17.38.106 pertaining to incorporation by reference of DEQ-4 as it pertains to water quality	NOTICE OF AMENDMENT (WATER QUALITY)

TO: All Concerned Persons

1. On June 17, 2004, the Board of Environmental Review published MAR Notice No. 17-213 regarding a notice of public hearing on the proposed amendment of the above-stated rules at page 1347, 2004 Montana Administrative Register, issue number 12, in conjunction with Department of Environmental Quality MAR Notice No. 17-212 which also pertains to the incorporation by reference of Department Circular DEQ-4.

2. The Board has amended ARM 17.30.716, 17.36.912, 17.36.914, 17.36.916, 17.36.922 and 17.38.106 exactly as proposed, and has amended ARM 17.38.101 as proposed, but with the following changes. Based on the comments received, several changes were made to the proposed revisions to the Circular. The revised Circular is available at the Department of Environmental Quality, Permitting and Compliance Division, 1520 East Sixth Avenue, P.O. Box 200901, Helena, Montana 59620-0901, or at www.deq.state.mt.us/wqinfo under Water Quality Circulars.

17.38.101 PLANS FOR PUBLIC WATER SUPPLY OR WASTEWATER SYSTEM (1) through (3)(h)(ii) remain as proposed.

(4) Before commencing or continuing the construction, alteration, extension, or operation of a public water supply ~~system~~ or wastewater system, the applicant shall submit a design report along with the necessary plans and specifications for the system to the department or a delegated division of local government for its review and written approval. Two sets of plans and specifications are needed for final approval. Approval by the department or a delegated division of local government is contingent upon construction and operation of the public water supply or wastewater system consistent with the approved design report, plans, and specifications. Failure of the system to operate according to the approved plans and specifications or the department's conditions of approval is an alteration that requires resubmittal of a design report, plans, and specifications for department approval.

(a) through (c) remain as proposed.

(d) The board ~~hereby~~ adopts and incorporates by reference ARM 17.36.320 through 17.36.325, 17.36.327 and 17.36.345. The design report, plans, and specifications for public subsurface sewage treatment systems must be prepared in accordance with ARM

17.36.320 through 17.36.325, 17.36.327 and 17.36.345 and in accordance with the format and criteria set forth in department Circular DEQ-4, "Montana Standards for Subsurface Wastewater Treatment Systems," 2004 edition.

(e) through (13) remain as proposed.

(14) The board ~~hereby~~ adopts and incorporates by reference the following:

(a) through (c) remain as proposed.

(d) department ~~of Environmental Quality~~ Circular DEQ-4, ~~2002~~ 2004 edition, which sets forth standards for subsurface wastewater treatment systems.

(e) and (15) remain as proposed.

3. A total of 26 comment letters were received. Of the 26 letters, 23 were in favor of the proposed changes to Department Circular DEQ-4, two letters were generally in opposition to the changes, and one letter was both favorable and unfavorable to specific changes. In addition, five members of the public testified at the public hearing. Four people were in favor of the proposed changes and one person was both favorable and unfavorable to specific changes. The comments received are as follows and appear with the Board's and Department's responses:

COMMENT NO. 1: There does not seem to be any reason for denying, in Section 4.3.3.2, the use of fill systems to meet vertical separation distance to limiting layers. The use of fill systems should be reconsidered. A previous draft of a Department circular allowed mound systems to meet separation distance when the depth to ground water was three feet or more from the natural ground surface. Also, engineered fill can provide better treatment than native soil. Allowing the use of fill solves problems and should be allowed at sites that only marginally exceed the vertical four-foot separation distance required by rule.

RESPONSE: The proposed change retains and clarifies the current prohibition, for replacement systems, against use of fill to meet vertical separation distances. The Board recognizes that there are situations when the use of fill systems in areas with less than four feet of vertical separation from the natural ground surface to a limiting layer offers a practical solution to replace a failed primary system. Deviations from Section 4.3.3.2 may be granted on a case-by-case basis in accordance with the criteria in Section 1.3.2.

The proposed change pertains to replacement systems only. Use of fill for new systems is prohibited by ARM 17.36.321(3)(b), and no waiver of that requirement is available. ARM 17.36.321(3)(b) was not proposed for amendment, so comments pertaining to use of fill to meet separation distances for new systems are outside the scope of this rulemaking.

COMMENT NO. 2: The language in Section 4.3.3.2 should explicitly state that fill may be used only when there is four feet of vertical separation distance from the natural ground surface to a limiting layer.

RESPONSE: The suggested language helps clarify the requirement and the section has been revised accordingly.

COMMENT NO. 3: The proposed language in Sections 6.2.1, 7.1, and 8.1 is appropriate but designers would have no control if a homeowner installs a water softener after the septic system is constructed. The requirement to accommodate water softener backwash in sizing new and replacement septic systems should be reevaluated in light of present construction standards. There has been a trend over the previous years to increase the size of drainfields through more aggressive regulation, and septic systems constructed in accordance with current standards may already have adequate capacity for the additional flow from water softener backwash.

RESPONSE: The language in Section 8.1 is prospective and is not intended to require homeowners to modify an existing septic system if they presently have or choose to install a water treatment device after the system is constructed. Instead, the language in Section 8.1 requires system designers/installers to consider the additional flow from water treatment devices when sizing new and replacement drainfields, which would be the most practical time to implement such a requirement.

The commentor correctly notes that, under current standards for new and replacement septic system design, there should be adequate capacity left in most systems to accommodate the additional flow from a water treatment device. Water softeners typically regenerate once or twice a week and produce approximately 50 gallons of backwash over a 30-minute period for each regeneration cycle. Current standards for new and replacement septic systems are that a drainfield for a three-bedroom home must be sized to accommodate 300 gallons per day of total wastewater. EPA guidance indicates that the average person generates approximately 40 to 70 gallons of wastewater per day. Assuming an average of approximately 2.5 people per household in Montana based on the 2000 census, there should be adequate capacity left in most septic systems to accommodate the additional flow from a water treatment device.

The Department also surveyed sanitarians in 38 counties/regions in Montana to determine if there were problems with water softeners and septic systems occurring on a statewide level. The results of that survey indicated that there were no documented septic system failures that could be attributed to water softener backwash. Several county sanitarians did indicate that there have been cases of hydraulic failure of undersized septic systems at residences that have water treatment devices. However, none of the sanitarians was able to document that the water treatment device was the actual cause of the failure. In a recent investigation of a failed septic system that was initially reported to have been caused by a water softener, it was determined through operational records that the cause of the failure was from household sources other than the water softener. Based on this and other information reviewed by the Department, hydraulic overloading of drainfields

from water treatment devices does not appear to be a common or widespread problem in Montana. Therefore, in most cases, new and replacement septic systems should not have to be increased beyond current design standards for homes with water softeners. However, the language in Section 8.1 will make septic system designers aware of the potential need to increase the size of a new or replacement drainfield to accommodate the additional flow from water treatment devices that may generate more backwash than a typical water softener.

COMMENT NO. 4: Percolation results do not always match the soil descriptions in Section 8, Table 8. Percolation testing could be eliminated and replaced by soil textural classification.

RESPONSE: The percolation rate/soil type tables in Chapter 8 are not proposed for amendment so this comment is outside the scope of this rulemaking. It should be noted, however, that Department subdivision rules and the Board minimum standards for local board of health sewage regulations require soil tests rather than percolation tests. However, the rules allow the reviewing authority to require percolation tests if needed in certain circumstances. See ARM 17.36.325 and 17.36.914.

COMMENT NO. 5: The regulatory structure should not discourage the use of experimental systems. Also, there is a lack of clear review, approval, and variance procedures at the local level. There is a need for coordination of procedures for review used by the Department, local health officials, and local governing bodies that review septic systems under the Subdivision and Platting Act (Title 76, chapter 3, MCA).

RESPONSE: Requirements concerning experimental systems and local variance procedures are outside the scope of this rulemaking. However, provision is made for experimental systems in Chapter 22 of Department Circular DEQ-4. The current Circular and rules have also been drafted with the intention of standardizing, among different reviewing authorities, the review criteria for experimental septic systems. The procedures set out in Chapter 22 for review and approval of experimental systems apply to Department and local reviewers performing subdivision review, and apply to local officials when they implement their Title 50, MCA, septic permitting authority. City and county officials reviewing subdivisions under the Platting Act also must follow the review and deviation criteria in the Circular. See 76-3-504(1)(f)(iii), MCA.

COMMENT NO. 6: Water softener brine discharge needs to be kept out of biological wastewater treatment systems because it causes stratification, inhibits solids settling, and has negative effects on the microorganisms that live in septic tanks and advanced treatment systems.

RESPONSE: The Department formed a technical committee that included members of the Department's subdivision task force, Department specialists, and industry representatives to examine the issue of potential effects of water softener backwash to

septic systems. The preponderance of the technical information reviewed by the committee, including information from EPA, supports the conclusion that there will not be problems caused by discharging backwash to septic systems.

The Department contacted state agencies across the country and found that, of the agencies responding, most do not prohibit water softener backwash into septic systems. The Department surveyed sanitarians in 38 counties/regions in Montana to determine if there were problems with water softeners and septic systems occurring on a statewide level. The results of that survey indicated that there were no documented septic system failures that could be attributed to water softener backwash.

Water softener backwash may have detrimental effects on aerobic, nonstandard and other proprietary systems. Therefore, the proposed language in Section 7.1 of Department Circular DEQ-4 prohibits the discharge of backwash from water softeners and other water treatment devices into these types of systems unless the discharge meets the specifications of the designer or manufacturer of the system.

COMMENT NO. 7: Discharging the water softener brine into many NSF Class I treatment systems voids the manufacturer's warranty, and anyone recommending such disposal would have to be prepared to accept liability for the consequences.

RESPONSE: The language in Section 7.1 of Department Circular DEQ-4 prohibits the discharge of backwash from water softeners and other water treatment devices into aerobic, nonstandard, and other types of proprietary systems unless the discharge meets the specifications of the designer or manufacturer of the system. See Response to Comment No. 6.

COMMENT NO. 8: When regulators consider whether to allow discharge of water softener brine to wastewater treatment systems, the burden of proof should be on the party who stands to profit from their position. Rather than asking wastewater system manufacturers to prove harm to the treatment system, water softener manufacturers should have to prove that addition of their waste to the stream does no harm.

RESPONSE: Representatives from the water softener industry actively participated in the deliberations of the Department's water softener committee that examined the issue of potential effects of water softener backwash to septic systems. The industry representatives provided the committee with extensive documentation to show that water softener backwash does not harm conventional septic systems. One industry representative also funded an investigation of a failed septic system that was initially reported to have been caused by a water softener. The investigation concluded that the water softener was not responsible for the system failure.

COMMENT NO. 9: The managers of many municipal systems have recognized the deleterious effects of brine on their anaerobic and aerobic processes, and have taken steps to keep brine out of their systems. It should be kept out of onsite systems too.

Not all "experts" agree with the published conclusions regarding water softeners and wastewater treatment systems, and recommend that further research is needed. Experienced soil scientists also disagree on the effects of brine on drainfields. Until conclusive research is done, the conservative public health approach is to require water softeners to discharge to their own drainfield or sump. This avoids the need to speculate on which technology caused the drainfield to fail. It is impractical to think that water softener users will monitor their devices' discharges, which may lead to brine concentrations higher than the manufacturer's recommendations. Water softener manufacturers must step up to the responsibility of helping their customers deal properly with the residual product that their appliance generates. This product is not the result of a biological process, and so it does not belong in a biological wastewater treatment system, whether onsite or municipal.

RESPONSE: The changes to Department Circular DEQ-4 address conventional onsite septic systems, which are constructed and operated very differently from large, municipal systems. Although technical experts may disagree on the effects of water softener brine to on-site septic systems, the preponderance of technical evidence reviewed by the Department, including information from EPA, indicate that water softener backwash will not cause septic system failure. The results of a statewide survey also did not find any documented septic system failures that could be attributed to water softener backwash. See Responses to Comment Nos. 6, 7 and 8.

COMMENT NO. 10: The proposed language in Section 7.1 "(A) conserves water by design" is vague and could be eliminated since the requirement in (B), for a demand-initiated regeneration control device, is the most likely method that water will be conserved. Also, an additional requirement must be added to the list in 7.1 for approval by the local health authority before a water softener can discharge to a septic system so that the county can decide if the backwash is acceptable in wastewater treatment systems due to either local regulation or soil conditions.

RESPONSE: The language in proposed Section 7.1(A) was not necessary in light of (B), and has been deleted. The word "only" also has been inserted in Section 7.1 to make the requirements of (A) and (B) more explicit and enforceable. However, adding a requirement to Department Circular DEQ-4 for approval by the local health authority is not necessary. Local boards of health have authority under Title 50, chapter 2, MCA, to adopt regulations for the control and disposal of sewage. The decision whether to impose more stringent local requirements on water softener discharges should be made at the local level. If local requirements are imposed, they will be binding on the Department in its review of subdivisions under the Sanitation in Subdivisions Act. See ARM 17.36.108(4).

COMMENT NO. 11: The paragraph in Section 7.1 that describes the alternative methods of backwash disposal should

include language that it must be discharged in a manner and location that will not affect the functioning of the wastewater treatment system.

RESPONSE: Section 7.1 contains a statement that the alternative disposal methods cannot be prohibited by other regulations. Department rules, which provide setback requirements for wastewater treatment systems from subsurface drains and other infrastructure, will protect the functioning of the wastewater treatment system. See ARM 17.36.323, Table 3. Also, as indicated in the Response to Comment No. 3, the amount of backwash will generally be small and the Department believes that there would be little potential for impacts.

COMMENT NO. 12: The proposed second paragraph in Section 8.1, which requires that new and replacement drainfields be adequately designed to dispose the additional flow from water softeners, iron filters, and reverse osmosis units, should be changed to include existing drainfields. Lake County requires permitting prior to installation of a water softener, in order to evaluate whether the additional flow can be handled by the existing septic system. The paragraph as written allows the addition of a water softener to an existing system without review.

RESPONSE: See Responses to Comment Nos. 3 and 10.

COMMENT NO. 13: The proposed third paragraph in Section 8.1 only suggests that the local health official be contacted, and only for systems within a given soil type. This is not consistent with current Lake County requirements.

RESPONSE: The third paragraph in Section 8.1 recommends that designers of systems contact local health officials for area-specific information on potential adverse impacts if the drainfield site contains clay soils with shrink/swell properties. Mandatory consultations are needed only if local conditions warrant, and the requirement for such consultations should be based in local rules. The language in the Circular does not interfere with the ability of local boards of health to adopt such rules. Also, a specific reference to clay soils with shrink/swell properties was added to the last sentence in the third paragraph for clarity.

COMMENT NO. 14: The Circular draft that was presented to the water softener committee is weak in indicating that water softener discharge is detrimental to wastewater treatment systems. It also is too vague to enforce, does nothing to limit flow from water softeners, makes contacting local health officials an option in clay soils, doesn't address the issue of adding water softener backwash after the system is constructed, doesn't give local boards of health an option to opt out of allowing water softener discharge into wastewater treatment systems, and has no language that holds the reviewer, designer, installer, or maintenance provider harmless should the wastewater treatment system fail as a result of accepting water softener discharge.

RESPONSE: Please see Responses to Comment Nos. 3, 6, 10 and 13. Failures should not occur from accepting water softener discharge if wastewater treatment systems are properly designed, constructed and operated. Also, it is not appropriate, in a technical design circular, to address the potential liabilities of reviewers, designers, and installers for failed wastewater treatment systems.

COMMENT NO. 15: Montana is a large state with many different types of water and soils. The job of writing an all-inclusive set of rules seems impossible in the short term. The proposed changes are sensible and follow other states that have considered the water softener issue. The Department has developed a sound rule that should be approved.

RESPONSE: Comment noted.

COMMENT NO. 16: The Montana Water Quality Association supports the new language in Department Circular DEQ-4 allowing the regeneration water from water softeners to go into septic tanks. During the last 20 years, technology has improved the salt usage and amount of total water discharged from a water softener to a septic tank. There has never been scientific or physical evidence proving that water softener regeneration waste has ever caused problems with the operation of a septic system.

RESPONSE: Comment noted.

COMMENT NO. 17: The proposed rules should be adopted. Based on review of published rules or contacts with state officials, 45 states allow softener backwash to septic systems. Ten of those states have some type of restriction such as a requirement for demand initiated regeneration equipment and three states, including Montana, presently ban backwash to septic systems. Studies also have shown that the backwash brine does not impact standard septic systems and drainfields.

RESPONSE: Comment noted.

COMMENT NO. 18: The Board received comment letters from 19 homeowners in Ethridge, Great Falls, Hamilton, Missoula, Havre, Bigfork, Lakeside, Victor, and Kalispell, Montana who have water softeners connected to septic systems. The letters describe how the homeowners' water softeners have been discharging to septic systems, in most cases for over 10 years and in some cases for over 30 years, without any problems. Several homeowners expressed concern over any new requirement to discharge the water softener backwash to a separate drainfield or dry well, indicating that such a requirement would be unnecessary, expensive or impractical.

RESPONSE: Comments noted.

COMMENT NO. 19: Properly functioning water softeners do not harm septic systems. Water softener regeneration backwash adds less than 8% to the total waste stream of a three-bedroom dwelling. Clay soil is widely distributed in Montana. The

calcium and magnesium captured by the water softener is useful for mitigating the impact of sodium in clay soils.

RESPONSE: Comment noted.

COMMENT NO. 20: The current prohibition in Department Circular DEQ-4 of discharge of water softener backwash to septic systems lacks scientific basis, and imposes a financial burden of $500 to $2000 for an alternative disposal system on homeowners who install water softeners. Modern water softeners are more efficient and have reduced salt consumption and wastewater generation compared to 20 years ago.

RESPONSE: Comment noted.

COMMENT NO. 21: The commentor is a water softener dealer whose business has been family-owned for 40 years, and has never heard of a septic system fail because of a water softener in his area.

RESPONSE: Comment noted.

COMMENT NO. 22: The use of on-demand water softening equipment is more economical for the consumer because there is less water usage, less salt consumption and less loading on the septic system. Some water is naturally high in sodium and sulfate, and there is a question as to whether these types of water could be a cause of septic system failure.

RESPONSE: Comment noted.

COMMENT NO. 23: The commentor has 35 years of experience installing septic systems and is a proponent of the water softener change, but has other concerns with Department Circular DEQ-4. Section 4.3.3.2 should allow the use of fill to meet minimum separation distances. A brief period of seasonally high ground water should not prevent the use of a septic system that uses engineered fill.

RESPONSE: Please see Response to Comment No. 1.

COMMENT NO. 24: A commentor expressed a concern with ARM 17.36.922, which allows a local board of health to grant variances from the requirements of Department Circular DEQ-4. Variances should be based on engineering, not on politics. The commentor also questioned what was meant by "seasonal" in ARM 17.36.916(5), which allows holding tank systems only for seasonal use.

RESPONSE: The current rulemaking does not propose any changes to ARM 17.36.922, so comments relating to the local variance procedures in that rule are outside the scope of this proceeding. It should be noted that the variance criteria set out in ARM 17.36.922 relate primarily to health, safety, and welfare, although local boards may adopt additional criteria. Local boards must also follow the criteria for approving deviations from Department Circular DEQ-4, which are set out in the Circular at Section 1.3.1. These criteria also focus on impacts to health, safety, and welfare. The term "seasonal", for purposes of the holding tank provisions in ARM 17.36.916, is

defined as "use for not more than a total of four months (120 days) during any calendar year." ARM 17.36.916(5)(a).

Reviewed by: BOARD OF ENVIRONMENTAL REVIEW

James M. Madden
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Rule Reviewer

By: *Joseph W. Russell*
JOSEPH W. RUSSELL, M.P.H.
Chairman

Certified to the Secretary of State, October 8, 2004.